What is Claimed is:

[c1] A conductive fuse for a semiconductor device, comprising:

a pair of contact portions integrally connected to a fusible portion by connecting portions;

said contact portions thicker than said connecting portions and said connecting portions thicker than said fusible portion;

a first dielectric under said connecting portions and said fusible portion and extending between said pair of contact portions; and

a second dielectric between said first dielectric and said fusible portion, said second dielectric extending between said connecting portions and defining the length of said fusible portion.

[c2] The conductive fuse of claim 1, wherein top surfaces of said contact, connecting and fusible portions are co-planer.

[c3] The conductive fuse of claim 1, wherein said fuse comprises a conductor formed by a damascene process.

[c4] The conductive fuse of claim 1, wherein said fuse comprises copper, aluminum or aluminum-copper, aluminum-copper-silicon or aluminum alloy.

[c5] The conductive fuse of claim 6, wherein said fuse comprises a conductor formed by a damascene process, said conductor comprising a conductive liner and a conductive core.

[c6] The conductive fuse of claim 5, wherein:

said conductive liner is selected from the group consisting of titanium, titanium nitride, tantalum, tantalum nitride, tungsten, tungsten nitride, chromium and layers thereof; and

said core conductor is selected from the group consisting of copper, aluminum, aluminum-copper, aluminum-copper-silicon and aluminum alloys.

[c7] The conductive fuse of claim 1, wherein said second dielectric is selectively etchable with respect to said first dielectric.

[c8] The conductive fuse of claim 1, wherein:

said first dielectric is selected from the group consisting of silicon nitride, silicon carbide, boron nitride and aluminum oxide; and

said second dielectric is selected from the group consisting of silicon oxide, silicon nitride, diamond, fluorine doped silicon oxide, spin on glass, porous silicon oxide, polyimide, polyimide siloxane, polysilsequioxane polymer, benzocyclobutene, paralyene, polyolefin, poly-naphthalene, fluropolymer resin, polyphenylene oligomer, methane doped silica, polymer foam and aerogel

[c9] The conductive fuse of claim 1, wherein:

said connecting portions are between 0.13 and 2.0 microns thick; and

said fusible portion is between 0.075 and 1.5 microns thick.

[c10] A method for fabricating a fuse for a semiconductor device, comprising:

providing a substrate;

forming a first dielectric layer on a top surface of said substrate;

forming a dielectric mandrel on a top surface of said first dielectric layer;

forming a second dielectric layer on top of said mandrel and a top surface of said first dielectric layer;

forming contact openings down to said substrate in said first and second dielectric layers on opposite sides of said mandrel;

removing said first dielectric layer from over said mandrel between said contact openings to form a trough; and

filling said trough and contact openings with a conductor.

[c11] The method of claim 10, further including removing a portion of said first dielectric layer between each contact opening and said mandrel.

[c12] The method of claim 11, further including forming a conductive liner in said trough and contact openings and over said mandrel.

[c13] The method of claim 11, wherein said conductor comprises copper, aluminum or aluminum-copper, aluminum-copper-silicon or aluminum alloy.

[c14] The method of claim 11, wherein said dielectric mandrel is selectively etchable with respect to said first and second dielectric layers.

[c15] The method of claim 11, wherein:

said dielectric mandrel is selected from the group consisting of silicon nitride, silicon carbide, boron nitride and aluminum oxide; and

said first and second dielectric layers are selected from the group consisting of silicon oxide, silicon nitride, diamond, fluorine doped silicon oxide, spin on glass, porous silicon oxide, polyimide, polyimide siloxane, polysilsequioxane polymer, benzocyclobutene, paralyene, polyolefin, poly-naphthalene, fluropolymer resin, polyphenylene oligomer, methane doped silica, polymer foam and aerogel.

[c16] A method for fabricating a fuse for a semiconductor device, comprising:

providing a substrate;

forming a first dielectric layer on a top surface of said substrate;

forming a dielectric mandrel on a top surface of said first dielectric layer;

forming a second dielectric layer on top of said mandrel and a top surface of said first dielectric layer;

forming, in a first region, contact openings down to said substrate in said first and second dielectric layers on opposite sides of said mandrel;

removing said first dielectric layer from over said mandrel and said first dielectric layer and a portion of said first dielectric layer between said contact openings and said mandrel to form a trough and simultaneously, in a second region, removing said first dielectric layer and a portion of said second dielectric to form a trench; and

filling said trough and contact openings with a conductor to form a fuse and filling said trench with the conductor to form a wire.

[c17] The method of claim 16, further including forming a conductive liner in said trough and contact openings and over said mandrel and in said trench.

[c18] The method of claim 16, wherein said conductor comprises copper, aluminum or aluminum-copper, aluminum-copper-silicon or aluminum alloy.

[c19] The method of claim 16, wherein said dielectric mandrel is selectively etchable with respect to said first and second dielectric layers.

[c20] The method of claim 16, wherein:

said dielectric mandrel is selected from the group consisting of silicon nitride, silicon carbide, boron nitride and aluminum oxide; and

said first and second dielectric layers are selected from the group consisting of silicon oxide, silicon nitride, diamond, fluorine doped silicon oxide, spin on glass, porous silicon oxide, polyimide, polyimide siloxane, polysilsequioxane polymer, benzocyclobutene, paralyene, polyolefin, poly-naphthalene, fluropolymer resin, polyphenylene oligomer, methane doped silica, polymer foam and aerogel.

[c21] A semiconductor device, comprising:

a semiconductor substrate having integrated circuits; and

at least one fuse, said fuse comprising:

a pair of contact portions integrally connected to a fusible portion by connecting portions;

said contact portions thicker than said connecting portions and said connecting portions thicker than said fusible portion;

a first dielectric under said connecting portions and said fusible portion and extending between said pair of contact portions; and

a second dielectric between said first dielectric and said fusible portion, said second dielectric extending between said connecting portions and defining the length of said fusible portion

[c22] The device of claim 21, wherein top surfaces of said contact, connecting and fusible portions are co-planer.

[c23] The device of claim 21, wherein said fuse comprises a conductor formed by a damascene process.

[c24] The device of claim 21, wherein said fuse comprises copper, aluminum or aluminum-copper, aluminum-copper-silicon or aluminum alloy.

[c25] The device of claim 21, wherein said fuse comprises a conductor formed by a damascene process, said conductor comprising a conductive liner and a conductive core.

[c26] The device of claim 25, wherein:

said conductive liner is selected from the group consisting of titanium, titanium nitride, tantalum, tantalum nitride, tungsten, tungsten nitride, chromium and layers thereof; and

said core conductor is selected from the group consisting of copper, aluminum, aluminum-copper, aluminum-copper-silicon and aluminum alloys.

[c27] The device of claim 21, wherein said second dielectric is selectively etchable with respect to said first dielectric.

[c28] The device of claim 21, wherein:

said first dielectric is selected from the group consisting of silicon nitride, silicon carbide, boron nitride and aluminum oxide; and

said second dielectric is selected from the group consisting of silicon oxide, silicon nitride, diamond, fluorine doped silicon oxide, spin on glass, porous silicon oxide, polyimide, polyimide siloxane, polysilsequioxane polymer, benzocyclobutene, paralyene, polyolefin, poly-naphthalene, fluropolymer resin, polyphenylene oligomer, methane doped silica, polymer foam and aerogel.

[c29] The device of claim 21, wherein:

said connecting portions are between 0.13 and 2.0 microns thick; and

said fusible portion is between 0.075 and 1.5 microns thick.